(406264-E) BUILDING AUTOMATION-I

Teaching Scheme		Examination Scheme
Lectures:	04 hrs. /week	Theory: 100 marks
Practical:	02 hrs. /week	Term work: 25 marks
		Oral: 50 marks

Fire Alarm System

UNIT I:

Fundamentals: What is Fire? Fire modes, History, Components, Principles of Operation

FAS Components: Field Components, Panel Components, Applications.

FAS Architectures: Types of Architectures, Examples

UNIT II

FAS loops: Classification of loops, Examples.

Calculations: Voltage drop calculation, Battery Calculation

Cause & effect matrix: Examples

UNIT III:

Fire Standards: FAS Design procedure in brief, NFPA 72A, BS 5839, IS

Security systems

UNIT IV:

Fundamentals: Introduction to Security Systems, Concepts

Access Components: Access Components, Access Components, Access control system Design.

UNIT V:

CCTV: Camera: Operation & types, Camera Selection Criteria, Camera Applications, DVR based system, DVM, Network design, Storage design.

CCTV Applications: CCTV Applications

UNIT VI:

Perimeter Intrusion: Concept, Components, Technology, Advanced Applications

Security Design: Security system design for verticles

Text and reference books:

S.No	Title	Author/ Publishing House
1	Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) (Hardcover)	by Reinhold A. Carlson (Author), Robert A. Di Giandomenico (Author)
2	Building Automation: Control Devices and Applications	by In Partnership with NJATC (2008)
3	Building Control Systems, Applications Guide (CIBSE Guide)	by The CIBSE (2000)
4	Design of Special Hazards and Fire Alarm Systems	by Robert Gagnon (2007)
5	Security/Fire Alarm Systems: Design, Installation, and Maintenance	by John E. Traister (1995)
6	CCTV (Newnes)	by Vlado Damjanovski (1999)
7	Security, ID Systems and Locks: The Book on Electronic Access Control (Newnes)	by Joel Konicek and Karen Little (1997)
8	Integrated Security Systems Design: Concepts, Specifications, and Implementation (v. 1)	by Thomas L. Norman CPP PSP CSC (2007)
9	Access Control Systems: Security, Identity Management and Trust Models	by Benantar, Messaoud, ; ISBN: 0387004459 EAN: 9780387004457 Publisher: Springer (Published: 12/2005)
10	Building Automation Online	by McGowan; McGowan, John J.; ISBN: 0824746155
11	Cctv	by Damjanovski, Vlado; ISBN: 0750671963 Edition: 3 Publisher: Butterworth-Heinemann (1999)
12	Cctv for Security Professionals	by Machette, Alan; Matchett, Alan R.; ISBN: 0750673036 EAN: 9780750673037 Publisher: Butterworth-Heinemann (2003)

13	CCTV Surveillance: Analog and Digital Video Practices and Technology	by Kruegle, Herman; ISBN: 0750677686 EAN: 9780750677684 Edition: 2 Publisher: Butterworth-Heinemann (2006)
14	Fire Alarm Guide for Property Managers	by Morawski, E.; ISBN: 1430306890 EAN: 9781430306894 Publisher: Kessinger Publishing (2007)
15	HVAC Control in the New Millennium	by Hordeski; Hordeski, Michael F.; Marcel Dekker; ISBN: 0824709152 EAN: 9780824709150 Publisher: Fairmont Press (2001)
16	HVAC Control System Design Diagrams	by Levenhagen, John I.; ISBN: 0070381291 EAN: 9780070381292 Publisher: McGraw-Hill Professional Publishing (1998)
17	HVAC Controls and Systems	by Levenhagen, John I.; Spethmann, Donald H.; ISBN: 0070375097 EAN: 9780070375093 Publisher: McGraw-Hill Professional Publishing (1993)

(406270-E) BUILDING AUTOMATION-II

Teaching Scheme   Examination Scheme

Lectures: 04 Hrs. /week   Theory: 100 marks

Practical: 02 Hrs. / week   Oral: 50 marks

HVAC

UNIT I:

Fundamentals: Introduction to HVAC, HVAC Fundamentals, Basic Processes (Heating, Cooling etc)

Basic Science: Air Properties, Psychometric Chart, Heat Transfer mechanisms, Examples.

Human Comfort: Human comfort zones, Effect of Heat, Humidity, Heat loss

UNIT II:

Processes: Heating Process & Applications (I.e. Boiler, Heater) , Cooling Process & Applications

(I.e. Chiller), Ventilation Process & Applications(I.e. Central Fan System, AHU, Exhaust Fans), Unitary Systems (VAV, FCU etc).

UNIT III:

Control Theory: Instrumentation Basics, Field components & use, DDC & applications

Architecture: Honeywell Architecture, BMS Components

UNIT IV:

Control Panel: HVAC Control Panel, MCC Basics, Panel Components

Communication: Communication Basics, Networks, BACNet, Modbus, LON

UNIT V:

Ashrae: Symbols

Energy Management: Advantages of BMS, Energy Savings concept & methods, Lighting control, Buiding Efficiency improvement, Green Building (LEED) Concept & Examples

UNIT VI:

Project Life Cycle: IBMS (HVAC, Fire & Security) project cycle, Project steps

BMS Verticles: Applications of BMS, Examples

Integration: IBMS Architecture, Normal & Emergency operation

Text and reference books:

S.No	Title	Author/ Publishing House
1	Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) (Hardcover)	by Reinhold A. Carlson (Author), Robert A. Di Giandomenico (Author)
2	Building Automation: Control Devices and Applications	by In Partnership with NJATC (2008)
3	Building Control Systems, Applications Guide (CIBSE Guide)	by The CIBSE (2000)
4	Design of Special Hazards and Fire Alarm Systems	by Robert Gagnon (2007)
5	Security/Fire Alarm Systems: Design, Installation, and Maintenance	by John E. Traister (1995)
6	CCTV (Newnes)	by Vlado Damjanovski (1999)
7	Security, ID Systems and Locks: The Book on Electronic Access Control (Newnes)	by Joel Konicek and Karen Little (1997)
8	Integrated Security Systems Design: Concepts, Specifications, and Implementation (v. 1)	by Thomas L. Norman CPP PSP CSC (2007)
9	Access Control Systems: Security, Identity Management and Trust Models	by Benantar, Messaoud, ; ISBN: 0387004459 EAN: 9780387004457 Publisher: Springer (Published: 12/2005)
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11	Cctv	by Damjanovski, Vlado; ISBN: 0750671963 Edition: 3 Publisher: Butterworth-Heinemann (1999)
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13	CCTV Surveillance: Analog and Digital Video Practices and Technology	by Kruegle, Herman; ISBN: 0750677686 EAN: 9780750677684 Edition: 2 Publisher: Butterworth-Heinemann (2006)
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